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09/586,561	06/02/2000	Juha Ylitalo	4770.81503	7618

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EXAMINER	
WILLIAMS, LAWRENCE B	
ART UNIT	PAPER NUMBER
2638	

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/586,561	YLITALO ET AL.	
	Examiner	Art Unit	
	Lawrence B Williams	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 July 2005* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17;26-42, 51-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,6-8,11,14-17,26,27,31-33,36,39-42,51 and 52* is/are rejected.

7)☒ Claim(s) *3-5,11,14-17,26,27,31-33,36 and 39-42* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Arguments

1. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 51-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marzetta (US Patent 6,307,882 B1) in view of Rahsid-Farrokhi et al. (US Patent 6,400,789 B1).

(1) With regard to claim 1, Marzetta discloses in Fig. 1, a method comprising steps of receiving at least two space-time coded signals from an antenna system associated with a first station (element 16_1; col. 2, lines 51-67); determining complex channel state information based on the received space-time coded signals (col. 3, lines 9-17). Marzetta does not however disclose sending the complex channel state information to the first station. However, Rahsid-Farrokhi et al. discloses sending complex channel state information to a first station (col. 5, lines 46-56).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Rahsid-Farrokhi et al. with the teachings of Marzetta as a method of improving the SINR of the system (col. 1, lines 35-52).

(2) With regard to claim 51, Rahsid-Farrokhi et al. discloses wherein the determining step occurs at a second station (col. 5, lines 45-56).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Rahsid-Farrokhi et al. with the teachings of Marzetta as a method of improving the SINR of the system.

(3) With regard to claim 52, Rahsid-Farrokhi et al. discloses in Fig. 1, element 167) wherein the determining step is performed by a processor at a second station (col. 5, lines 45-56).

3. Claims 2, 6, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marzetta (US Patent 6,307,882 B1) in view of Rahsid-Farrokhi et al. (US Patent 6,400,789 B1) as applied to claim 1 above, and further in view of Ariv et al. (US Patent 6,621,877 B1).

(1) With regard to claim 2, claim 2 inherits all limitations of claim 1 above. As noted above, Marzetta in combination with Rahsid-Farrokhi et al. disclose all limitations of claim 1. They do not however teach, the method further comprising a step of segmenting the complex channel state information into a plurality of channel state information segments, wherein the step of sending the complex channel state information includes sending the plurality of channel state information segments in a sequence.

However, Ariv et al. discloses segmenting complex channel state information into a plurality of channel state information segments, wherein the step of sending the complex channel state information includes sending the plurality of channel state information segments in a sequence (col. 3, lines 20-41).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Ariv et al. with the invention of Marzetta in combination with Rahsid-Farrokhi et al. as a method of mitigating errors (col. 1, lines 39-44).

(2) With regard to claim 6, Ariv et al. also discloses receiving the plurality of channel state information segments; reconstructing the complex channel state information from the received plurality of channel state information segments (col. 4, lines 11-36), while Rashid-Farrokhi et al. discloses weighting first and second feed signals to feed respective first and second antennas based complex channel state information. It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Ariv et al. with the invention of Marzetta in combination with Rahsid-Farrokhi et al. as a method of mitigating errors (col. 1, lines 39-44).

(3) With regard to claim 7, Ariv et al. also discloses wherein the step of sending includes sequentially sending the plurality of channel state information segments over a time period based on a channel coherence time (col. 3, lines 42-56).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Ariv et al. with the invention of Marzetta in combination with Rahsid-Farrokhi et al. as a method of mitigating errors (col. 1, lines 39-44).

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marzetta (US Patent 6,307,882 B1) in view of Rahsid-Farrokhi et al. (US Patent 6,400,789 B1) as applied to claim 2 and further in view of Heiskala (US Patent 6,298,035 B1).

As noted above, the combination of Marzetta and Rahsid-Farrokhi et al. disclose all limitations of claim 2 above, including a multi-beam antenna array Fig. 1, element 121); and the step of receiving receives first and second space-time coded signals from respective first and second beams of the multi-beam antenna array (col. 5, lines 15-20). They do not however explicitly disclose the step of determining the complex channel state information based on the received first and second space-time coded signals, though Rahsid-Farrokhi et al. discloses determining a weight vector for each wireless terminal (col. 6, lines 12-53).

However, Heiskala discloses estimation of two propagation channels where he teaches the step of determining the complex channel state information based on the received first and second signals (col. 2, lines 33-41).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Heiskala with the combined invention of Marzetta and Rahsid-Farrokhi et al. as a method of improving channel estimation (col. 2, lines 15-24).

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marzetta (US Patent 6,307,882 B1) in view of Rahsid-Farrokhi et al. (US Patent 6,400,789 B1) as applied to claim 1 above, and further in view of Canada et al. (US Patent 6,546,236 B1) and Heiskala (US Patent 6,298,035 B1).

As noted above, Marzetta in combination with Rahsid-Farrokhi et al. disclose all limitations of claim 1 above including first and second diversity antennas (Rashid-Farrokhi et al., Fig. 1, elements 105-1-105-n) and the step of the step of receiving receives first and second space-time coded signals from respective first and second diversity antennas (col. 5, lines 46-55).

They do not however teach the first and second orthogonally polarized antennas and first and second antennas spatially separated by at least one wavelength. However, Canada et al. discloses first and second orthogonally polarized antennas (Fig. 1, elements 22, 24) and first and second antennas spatially separated by at least one wavelength (col. 2, lines 34-43).

It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Canada et al. with the combined teachings of Marzetta and Rahsid-Farrokhi et al. as a method of enhancing a received signal.

Neither of the cited reference explicitly disclose the step of determining the complex channel state information based on the received first and second space-time coded signals, though Rahsid-Farrokhi et al. discloses determining a weight vector for each wireless terminal (col. 6, lines 12-53).

However, Heiskala discloses estimation of two propagation channels where he teaches the step of determining the complex channel state information based on the received first and second signals (col. 2, lines 33-41).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Heiskala with the combined teachings of Canada et al., Marzetta and Rahsid-Farrokhi et al. as a method of improving channel estimation (col. 2, lines 15-24).

6. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marzetta (US Patent 6,307,882 B1) in view of Rahsid-Farrokhi et al. (US Patent 6,400,789 B1) as applied to claim 1, and further in view of Parkvall et al. (US Patent 6,542,736 B1).

As noted above, Marzetta in combination with Rahsid-Farrokhi et al. disclose all

limitations of claim 1 above. They do not however teach transmitting the first and second space-time coded signals with first and second signature codes embedded in the respective first and second space-time coded signals, the first and second signature codes being substantially orthogonal so that a second station can separate a composite signal into the first and second space-time coded signals, wherein the step of receiving receives the first and second space-time coded signals as the composite signal at the second station.

However, Parkvall et al. discloses transmitting the first and second space-time coded signals with first and second signature codes embedded in the respective first and second space-time coded signals, the first and second signature codes being substantially orthogonal so that a second station can separate a composite signal into the first and second space-time coded signals, wherein the step of receiving receives the first and second space-time coded signals as the composite signal at the second station (col. 10, line 66-col. 11, line 11).

It would have been obvious to one skilled in the art to incorporate the teachings of Parkvall et al. with the combined teachings of Marzetta and Rahsid-Farrokhi et al. as a method of providing an improved link adaptation and sector selection scheme (col. 3, lines 65-67).

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marzetta (US Patent 6,307,882 B1) in view of Rahsid-Farrokhi et al. (US Patent 6,400,789 B1) as applied to claim 1 and further in view of Kroeger et al. (US Patent 6,549, 544 B1).

As noted above, Marzetta in combination with Rahsid-Farrokhi et al. disclose all limitations of claim 1 above. They do not however teach wherein the complex channel state information includes at least one weight, each weight including amplitude and phase angle

information. However, Kroeger et al. discloses complex channel state information includes at least one weight, each weight including amplitude and phase angle information (col. 9, lines 33-49).

It would have been obvious to one skilled in the art at the time of the invention to incorporate the teachings of Kroeger et al. with the combined teachings of Marzetta and Rahsid-Farrokhi et al. to provide an interference tolerance system (col. 1, lines 51-56).

8. Claims 16, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marzetta (US Patent 6,307,882 B1) in view of Rahsid-Farrokhi et al. (US Patent 6,400,789 B1) as applied to claim 1 and further in view of Canada et al. (US Patent 6,546,236 B1).

(1) With regard to claim 16, as noted above, Marzetta in combination with Rahsid-Farrokhi et al. disclose all limitations of claim 1 above. They do not however teach determining a correction phase angle to adjust a first phase of a first space-time coded signal transmitted from a first antenna relative to a second phase of a second space-time coded signal transmitted from a second antenna so that the first and second space- time coded signals constructively reinforce at a second station.

However, Canada et al. discloses determining a correction phase angle to adjust a first phase of a first space-time coded signal transmitted from a first antenna relative to a second phase of a second space-time coded signal transmitted from a second antenna so that the first and second space- time coded signals constructively reinforce at a second station (col. 4, lines 13-46).

It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Canada et al. with the combined teachings of Marzetta and Rahsid-Farrokhi et al. as a method of generating an enhanced signal (col. 2, lines 34-42).

(2) With regard to claim 17, Canada et al. also discloses measuring a first phase angle defined by the first phase; measuring a second phase angle defined by the second phase; and determining the correction phase angle defined to be a difference between the second phase angle and the first phase angle (col. 3, lines 20-25; col. 4, lines 13-46).

It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Canada et al. with the combined teachings of Marzetta and Rahsid-Farrokhi et al. as a method of generating an enhanced signal.

9. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marzetta (US Patent 6,307,882 B1) in view of Rahsid-Farrokhi et al. (US Patent 6,400,789 B1).

(1) With regard to claim 26, Marzetta discloses in Fig. 1, a system (10) comprising a remote station (18, 20), the remote station including: a receiver (18) to receive at least two space-time coded signals from an antenna system (22_1); a processor (Fig. 2 discloses a processing scheme for determining propagation characteristics. A processor would be inherent.) to determine complex channel state information from the received space-time coded signals. Marzetta does not teach a transmitter to send the complex channel state information to a base station.

However, Rahsid-Farrokhi et al. teaches in Fig. 1, a transmitter (101) to send complex channel state information to a base station (col. 5, lines 46-56).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Rahsid-Farrokhi et al. with the teachings of Marzetta as a method of improving the SINR of the system (col. 1, lines 35-52).

10. Claims 27, 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marzetta (US Patent 6,307,882 B1) in view of Rahsid-Farrokhi et al. (US Patent 6,400,789 B1) as applied to claim 26 above, and further in view of Ariv et al. (US Patent 6,621,877 B1).

(1) With regard to claim 27, claim 27 inherits all limitations of claim 26 above. As noted above, Marzetta in combination with Rahsid-Farrokhi et al. disclose all limitations of claim 26. They do not however teach, wherein the processor includes a processor module to segment the complex channel state information into a plurality of channel state information segments, and the transmitter includes circuitry to send the complex channel state information in a sequence of the channel state information segments.

However, Ariv et al. discloses segmenting complex channel state information into a plurality of channel state information segments, wherein the step of sending the complex channel state information includes sending the plurality of channel state information segments in a sequence (col. 3, lines 20-41). Therefore a processor including a processor module to segment the complex channel state information into a plurality of channel state information segments, and a transmitter includes circuitry to send the complex channel state information in a sequence of the channel state information segments would be inherent to accomplish the method disclosed by Ariv et al.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Ariv et al. with the invention of Marzetta in combination with Rahsid-Farrokhi et al. as a method of mitigating errors (col. 1, lines 39-44).

(2) With regard to claim 31, Ariv et al. also disclose a receiver (Fig. 2) to receiving the plurality of channel state information segments; a processor to reconstruct (elements 27-28) the complex channel state information from the received plurality of channel state information segments (col. 4, lines 11-36), while Rashid-Farrokhi et al. discloses a processor (Fig. 1, element 169) to weight first and second feed signals to feed respective first and second antennas based complex channel state information. It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Ariv et al. with the invention of Marzetta in combination with Rahsid-Farrokhi et al. as a method of mitigating errors (col. 1, lines 39-44).

(3) With regard to claim 32, Ariv et al. also discloses wherein the step of sending includes sequentially sending the plurality of channel state information segments over a time period based on a channel coherence time (col. 3, lines 42-56).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Ariv et al. with the invention of Marzetta in combination with Rahsid-Farrokhi et al. as a method of mitigating errors (col. 1, lines 39-44).

11. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marzetta (US Patent 6,307,882 B1) in view of Rahsid-Farrokhi et al. (US Patent 6,400,789 B1) as applied to claim 2 and further in view of Heiskala (US Patent 6,298,035 B1).

As noted above, the combination of Marzetta and Rahsid-Farrokhi et al. disclose all limitations of claims 2 above, including a multi-beam antenna array Fig. 1, element 121); and the receiver receives first and second space-time coded signals from respective first and second beams of the multi-beam antenna array (col. 5, lines 15-20). They do not however explicitly the processor determining the complex channel state information based on the received first and second space-time coded signals, though Rahsid-Farrokhi et al. discloses determining a weight vector for each wireless terminal (col. 6, lines 12-53).

However, Heiskala discloses estimation of two propagation channels where he teaches a processor (Fig. 4, element 418) for determining the complex channel state information based on the received first (406) and second (412) signals (col. 2, lines 33-41).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Heiskala with the combined invention of Marzetta and Rahsid-Farrokhi et al. as a method of improving channel estimation (col. 2, lines 15-24).

12. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marzetta (US Patent 6,307,882 B1) in view of Rahsid-Farrokhi et al. (US Patent 6,400,789 B1) as applied to claim 1 above, and further in view of Canada et al. (US Patent 6,546,236 B1) and Heiskala (US Patent 6,298,035 B1).

As noted above, Marzetta in combination with Rahsid-Farrokhi et al. disclose all limitations of claim 1 above including first and second diversity antennas (Rashid-Farrokhi et al., Fig. 1, elements 105-1-105-n) and the receiver receiving first and second space-time coded signals from respective first and second diversity antennas (col. 5, lines 46-55).

They do not however teach the first and second orthogonally polarized antennas and first and second antennas spatially separated by at least one wavelength. However, Canada et al. discloses first and second orthogonally polarized antennas (Fig. 1, elements 22, 24) and first and second antennas spatially separated by at least one wavelength (col. 2, lines 34-43).

It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Canada et al. with the combined teachings of Marzetta and Rahsid-Farrokhi et al. as a method of enhancing a received signal.

Neither of the cited reference explicitly disclose a processor determining the complex channel state information based on the received first and second space-time coded signals, though Rahsid-Farrokhi et al. discloses determining a weight vector for each wireless terminal (col. 6, lines 12-53).

However, Heiskala discloses estimation of two propagation channels where he teaches a processor (418) determining the complex channel state information based on the received first and second signals (col. 2, lines 33-41).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Heiskala with the combined teachings of Canada et al., Marzetta and Rahsid-Farrokhi et al. as a method of improving channel estimation (col. 2, lines 15-24).

13. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marzetta (US Patent 6,307,882 B1) in view of Rahsid-Farrokhi et al. (US Patent 6,400,789 B1) as applied to claim 26, and further in view of Parkvall et al. (US Patent 6,542,736 B1).

As noted above, Marzetta in combination with Rahsid-Farrokhi et al. disclose all

limitations of claim 1 above. They do not however teach transmitting the first and second space-time coded signals with first and second signature codes embedded in the respective first and second space-time coded signals, the first and second signature codes being substantially orthogonal so that a second station can separate a composite signal into the first and second space-time coded signals, the receiver includes circuitry to receive the first and second space-time coded signals as the composite signal.

However, Parkvall et al. discloses transmitting the first and second space-time coded signals with first and second signature codes embedded in the respective first and second space-time coded signals, the first and second signature codes being substantially orthogonal so that a second station can separate a composite signal into the first and second space-time coded signals, and the receiver includes circuitry to receive the first and second space-time coded signals as the composite signal at the second station (col. 10, line 66-col. 11, line 11).

It would have been obvious to one skilled in the art to incorporate the teachings of Parkvall et al. with the combined teachings of Marzetta and Rahsid-Farrokhi et al. as a method of providing an improved link adaptation and sector selection scheme (col. 3, lines 65-67).

14. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marzetta (US Patent 6,307,882 B1) in view of Rahsid-Farrokhi et al. (US Patent 6,400,789 B1) as applied to claim 26 and further in view of Kroeger et al. (US Patent 6,549,544 B1).

As noted above, Marzetta in combination with Rahsid-Farrokhi et al. disclose all limitations of claim 26 above. They do not however teach wherein the complex channel state information includes at least one weight, each weight including amplitude and phase angle

information. However, Kroeger et al. discloses complex channel state information includes at least one weight, each weight including amplitude and phase angle information (col. 9, lines 33-49).

It would have been obvious to one skilled in the art at the time of the invention to incorporate the teachings of Kroeger et al. with the combined teachings of Marzetta and Rahsid-Farrokhi et al. to provide an interference tolerance system (col. 1, lines 51-56).

15. Claims 41, 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marzetta (US Patent 6,307,882 B1) in view of Rahsid-Farrokhi et al. (US Patent 6,400,789 B1) as applied to claim 1 and further in view of Canada et al. (US Patent 6,546,236 B1).

(1) With regard to claim 16,as noted above, Marzetta in combination with Rahsid-Farrokhi et al. disclose all limitations of claim 1 above. They do not however teach circuitry to determine a correction phase angle to adjust a first phase of a first space-time coded signal transmitted from a first antenna relative to a second phase of a second space-time coded signal transmitted from a second antenna so that the first and second space- time coded signals constructively reinforce at a second station.

However, Canada et al. discloses circuitry (Fig(s) 1, 2, for determining a correction phase angle to adjust a first phase of a first space-time coded signal transmitted from a first antenna relative to a second phase of a second space-time coded signal transmitted from a second antenna so that the first and second space- time coded signals constructively reinforce at a second station (col. 4, lines 13-46).

It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Canada et al. with the combined teachings of Marzetta and Rahsid-Farrokhi et al. as a method of generating an enhanced signal (col. 2, lines 34-42).

(2) With regard to claim 17, Canada et al. also discloses the circuitry comprising logic to measure a first phase angle defined by the first phase; logic to measure a second phase angle defined by the second phase; and logic to determine the correction phase angle defined to be a difference between the second phase angle and the first phase angle (col. 3, lines 20-25; col. 4, lines 13-46; col. 4, lines 38-46).

It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Canada et al. with the combined teachings of Marzetta and Rahsid-Farrokhi et al. as a method of generating an enhanced signal.

Allowable Subject Matter

16. Claims 3-5, 9-10, 12-13, 28-30, 34-35, 37-38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a.) Dabak et al. discloses in US 6,594,473 B1 Wireless System With Transmitter Having

Multiple Transmit Antennas and Combining Open Loop and Closed Loop Transmit Diversities.

b.) Lee et al. discloses in US 2004/0116077 A1 Transmitter Device and Receiver Device Adopting Space Time Transmit Diversity MultiCarrier CDMA, and Wireless Communication System With The Transmitter Device and the Receiver Device.

c.) Kim et al. discloses in US 2005/0037718 A1 Device and Method for Transmitting and Receiving Data By A Transmit Diversity Scheme Using Multiple Antennas In A Mobile Communications System.

d.) Hwang discloses in US 2003/0228850 B1 Transmit Diversity Apparatus For Mobile Communication System And Method Thereof.

e.) Kumar discloses in US Patent 5,825,807 System And Method For Multiplexing A Spread Spectrum Communication System.

f.) Aiken et al. discloses in US Patent 6,232,921 B1 Method And System For Adaptive Signal Processing For An Antenna Array.

g.) Agrawal et al. discloses in US Patent 6,134,215 Using Orthogonal Waveforms To Enable Multiple Transmitters To Share A Single CDM Channel.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence B Williams whose telephone number is 571-272-3037. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lawrence B. Williams

lbw
October 2, 2005

EMMANUEL BAYARD
PRIMARY EXAMINER